

1288.43076X00

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicants: Shinji KIMURA et al.

Serial No.: 10/648,252

Filed: August 27, 2003

For: CONTROL OF STORAGE AND READ OF DATA ON MASS  
MEMORY DEVICE

Group: 2185

Examiner: Not yet assigned

**INFORMATION DISCLOSURE STATEMENT  
UNDER 37 CFR §1.97 & 1.98**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

December 22, 2004

Sir:

In the matter of the above-identified application, Applicants are submitting herewith a search report and copies of the documents listed in the attached form equivalent to Form PTO-1449 for the Examiner's consideration.

This information disclosure statement is being submitted before the mailing date of a first office action on the merits.

Each of the documents listed on the attached form equivalent to Form PTO-1449 is in the English language.

It is respectfully requested that this information disclosure statement be considered by the Examiner.

Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to the deposit account of Mattingly, Stanger & Malur, Deposit Account No. 50-1417 (referencing

attorney docket no. 1288.43076X00) please credit any excess fees to such  
deposit account.

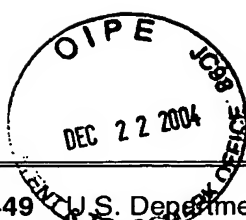
Respectfully submitted,



---

Frederick D. Bailey  
Registration No. 42,282  
MATTINGLY, STANGER & MALUR, P.C.

FDB/sdb  
(703) 312-6600



SHEET 1 OF 1

**FORM PTO-1449** U.S. Department of  
Commerce (Rev. 4/92) Patent and Trademark  
Office

ATTY. DOCKET NO.

**1288.43076X00**

SERIAL NO.

**10/648,252**

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(Use several sheets if necessary)

APPLICANT  
**Shinji KIMURA et al.**FILING DATE  
**August 27, 2003**GROUP  
**2185**

**U.S. PATENT DOCUMENTS**

EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	<b>2004/186961 A1</b>	<b>09-2004</b>	<b>KIMURA et al.</b>			
	<b>2002/0087780 A1</b>	<b>07-2002</b>	<b>SELKIRK et al.</b>			
	<b>6,556,998</b>	<b>04-2003</b>	<b>MUKHERJEE et al.</b>			
	<b>6,502,162</b>	<b>12-2002</b>	<b>BLUMENAU et al.</b>			
	<b>5,918,229</b>	<b>06-1999</b>	<b>DAVIS et al.</b>			

**FOREIGN PATENT DOCUMENTS**

	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	ABSTRACT	
						YES	NO

**OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)**


EXAMINER

DATE CONSIDERED

**EXAMINER:** Initial if citation is considered, draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

(Form PTO-1449 [6-4])

## LACASSE &amp; ASSOCIATES, LLC



## PROFESSIONAL PATENT SERVICES

1725 Duke Street, Suite 650

Alexandria, Virginia 22314

Telephone (703) 838-7683

Facsimile (703) 838-7684

e-mail: patserv@lacasse-patents.com

Writer's e-mail: &lt;last name&gt;@lacasse-patents.com



October 26, 2004

Via Federal Express

Noboru Otsuka

Hitachi, Ltd.

IP Development &amp; Management Division

Patent Dept. 4

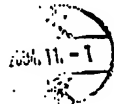
292, Yoshida-cho, Totsuka, Yokohama-shi

Kanagawa, Japan 244-0817

RE: PATENTABILITY SEARCH FOR CONTROL OF STORAGE AND READ OF  
DATA ON MASS STORAGE DEVICE

Your File: 340300339US01

Our Docket: PSP-1041949



Dear Mr. Otsuka:

In accordance with your request, we have conducted a patentability search on the above-identified subject matter.

Enclosed with this report are copies of the search results and your disclosure materials. If after reviewing the results, you feel that the search feature (or specific search elements), the field of search, or results are not commensurate with your original request, or you would like to extend the search into additional areas, please contact us.

Sincerely,

*NMalla*  
Nidhi Malla

Enclosures

NM:JT:rlb

s04/psp1041949

Director  
Randy W. Lacasse\*

Associate Director  
Ravi Soundararajan\*

Of Counsel  
Wes Strickland§

Patent Prosecution  
Jaclyn A. Schade\*  
Monica Ullagaddi  
Ben Agbdasi, Ph.D.  
Nidhi Malla  
Elizabeth A. Heintz

\*Registered Patent Agent  
§Registered Patent Attorney  
†Manager  
‡Assistant Manager

Patent Research  
Jerry R. Lacasse  
Thien Tran\*  
William C. McBeth  
Juliana Tanase  
Sejal Gangar  
Ben Agbdasi, Ph.D.  
Jesse Miyoshi  
Simana Basu  
Danielle C. Williams

Patent Services  
LaRieko Welch†  
Terry L. Lacasse

IP Document Services  
Larry J. Heckert†  
Brian G. Willingham‡  
Andrew K. Kamara

BEST AVAILABLE COPY

**CONFIDENTIAL**  
**(Patentability Search)****I. SEARCH FEATURE****A. General**

Storage Control

**B. Specific**

A data source device that provides data in response to requests from a plurality of clients comprising:

a disk device configured to store the data including a share volume with specified capacity that is used in common among the plurality of clients and a plurality of specific volumes that are segmented one another, each of which is associated with one of the plurality of clients;

a virtual volume management module that allocates a virtual volume to each of the plurality of clients;

a block mapping management module that manages mapping between a virtual block, which is defined in the virtual volume, and a physical block, which is physically defined in the share volume and the specific volume;

a command receiving module that receives a read out command from the client, which involves specification of the virtual block; and

a read out control module that reads out the data corresponding to the virtual block from the specific volume associated with the client or the share volume, with reference to the block mapping management module, to be output to the client that has issued the read out command.

**C. Application**

Lowering reading speed by reading from share volume

Patentability/Otsuka/October 27, 2004  
ESP-1041949

Page 3 of 5

## II. FIELD OF SEARCH

The search of the above features was conducted in the following areas:

### A. Classification search

<u>Class</u>	<u>Subclasses</u>	<u>Description</u>
709/		ELECTRICAL COMPUTERS AND DIGITAL PROCESSING SYSTEMS: MULTICOMPUTER DATA TRANSFERRING OR PLURAL PROCESSOR SYNCHRONIZATION
	213	. Multicomputer data transferring via shared memory
	215	.. Partitioned shared memory
	219	.. Accessing a remote
711/		ELECTRICAL COMPUTERS AND DIGITAL PROCESSING SYSTEMS: MEMORY
	114	.... Arrayed (e.g., RAIDs)
	147	. Shared memory area
	148	.. Plural shared memories
	153	.. Shared memory partitioning
	203	.. Virtual addressing

The above subclasses represent areas deemed to contain subject matter of interest to one or more of the search features. Please note that relevant references may be classified outside of these areas. The integrity of the search is based on the records as presented to us by the United States Patent and Trademark Office (USPTO). No further integrity studies were performed. Also a key word search was performed on the USPTO full-text database including published U.S. patent applications.

## III. RESULTS OF SEARCH

### A. References developed as a result of search

<u>U.S. Patent No.</u>	<u>Inventor</u>
5,918,229	Davis et al.
6,502,162 B2	Blumenau et al.
6,556,998 B1	Mukherjee et al.

<u>U.S. Patent Application Publication No.</u>	<u>Inventor</u>
2002/0087780 A1	Selkirk et al.
2004/0186961 A1	Kimyra et al.

BEST AVAILABLE COPY

B. Discussion of references in numerical order:

The patent to Davis et al. (5,918,229) assigned to Mangosoft Corporation provides for a *Structured Data Storage using Globally Addressable Memory*. Shown in figure 5 is a shared memory subsystem 220, and nodes 212a-212c that may connect via the shared memory subsystem 220 to a virtual shared memory 222. The virtual shared memory 222 can map to devices that provide physical storage for computer readable data, such as pages 224a-224d. Even though this reference does not appear to show specific volume access, it does appear to show a method of accessing virtual shared volume that is mapped to physical devices (see column 18 lines 20-24, column 19 lines 7-10).

The patent to Blumenau et al. (6,502,162 B2) assigned to EMC Corporation provides for *Configuring Vectors of Logical Storage Units for Data Storage Partitioning and Sharing*. Discussed is a volume access table 82. Each entry in the table includes a volume group name and host controller port and private/shared flag. Volume group name may provide a unique identification number for a group of logical storage volumes to be accessed from a host port. The private/shared flag may indicate the logical volumes that are private/shared. The specification of particular volumes should allow flexibility in defining overlap between the groups corresponding to certain volumes that are shared by the host processors. Volume access appears to advance by checking the private/shared flag of an indexed entry. If private, the port adapter accesses the logical volume specified by the host controller. If the private flag is not set, than execution appears to branch to check locking information for cache, and if the cache is locked, the host controller may be placed on a wait list until logical volumes become available. A host may request access to specified logical volume in storage subsystem. Logical Unit Numbers (LUNs) may be mapped to logical volumes and reported to the host by the port adapter (see figure 5 and 9; column 2, lines 25-26; column 11 lines 66-67; column 12 lines 4-6, 19-22, and 55-57; column 16, lines 10-28; column 19, lines 46-47, 51-54, and 66-67).

The patent to Mukherjee et al. (6,556,998 B1) assigned to Matsushita Electric industrial Co., Ltd. provides for *Real-Time Distributed File System*. Discussed are two types of disks autonomous data disks (ADD) 42 and legacy attribute disks (LAD) 44. DFS may have volumes to intersect. Volumes 94 and 98 may intersect at disk 96 and an ADD 42 may be part of more than one volume. Those ADDs are called Shared ADDs (SADD) 96. A SADD 96 is not partitioned, and it simultaneously serves all the volumes of which it is a member. Each virtual block in a file has a virtual block address (VBA). Given a VBA, the DFS maps it to the appropriate logical block address (LBA) within the volume 46. Since a DFS volume 46 typically consists of multiple ADDs 42, each VBA is mapped to the LBA of the corresponding ADD 42 within volume 46. This gives rise to a translation table that maps a VBA and LBA and Id of ADD 42. A table with these mappings is kept as a file in the LAD 44, and is used as meta-data for DFS file access. This file is referred to as the attribute file. In order to access a

Patentability/Otsuka/October 27, 2004  
RSP-1041949

Page 5 of 5

DFS file, a user 16 must first get the corresponding attribute file (see column 4 lines 24-27, lines 57-62, column 5 lines 33-37, lines 63-67, and column 6 lines 1-7).

The patent application publication to Selkirk et al (2002/0087780 A1) assigned to Storage Technology Corporation provides for a *Floating Virtualization Layers*. Discusses a method of host-based virtualization that may provide virtual names 230-236 that relate to the hosts 202-208 to which those volumes 230-236 are assigned. Physical devices 220-228 from each of the host operating systems may be replaced with virtual images appropriate to the individual host. While this reference does not appear to show a virtual mapping of shared and specific volumes, it does appear to show physical to virtual volume mapping and host access to certain virtual volumes (see paragraphs 21 and 24).

#### IV. SUMMARY

US patent application publication 2004/0186961 A1 appears to be relevant to the search feature; however, the authors appear to be the same as in the search disclosure.



Julia Tanase

BEST AVAILABLE COPY